

## PATENT ABSTRACTS OF JAPAN

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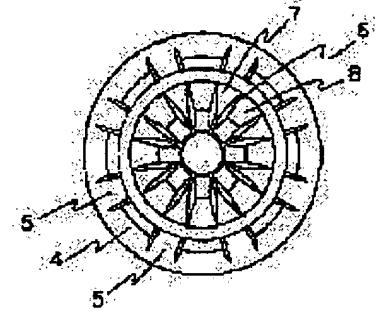
(72)Inventor : MIURA MASAKI

## (54) SYNTHETIC RESIN BOTTLE

## (57)Abstract:

**PROBLEM TO BE SOLVED:** To prevent a ground part from deforming due to heating by a blade heater of a bottom and improve self-supporting stability and shape retention ability by providing a notch on the ground part in a bottle comprising a dome with a bottom recessed inward in the bottle and the ground part provided around the dome.

**SOLUTION:** The synthetic resin bottle with a circular lateral cross sectional shape is equipped with a dome recessed inward in the bottle on a bottom of a bottle body, and a periphery of the dome at the bottom is a ground part 4. In this case, a plurality of, eight for example, notches 5 are provided at approximately uniform intervals on the ground part 4. An uneven part 6 comprising recesses 1 and protrusions 8 alternately and radially provided from the center is formed on the dome 3, thereby reinforcing the strength of the dome. The ground part except the dome 3 of the bottom 2 is a flat plane, while the notches 5 and the recesses 7 of the uneven part 6, and the ground part 4 and the protrusions 8 of the uneven part 6 are provided respectively at the same position on radial lines in the approximately same direction from the center, thereby improving the strength of the bottom 2 and also improving moldability.



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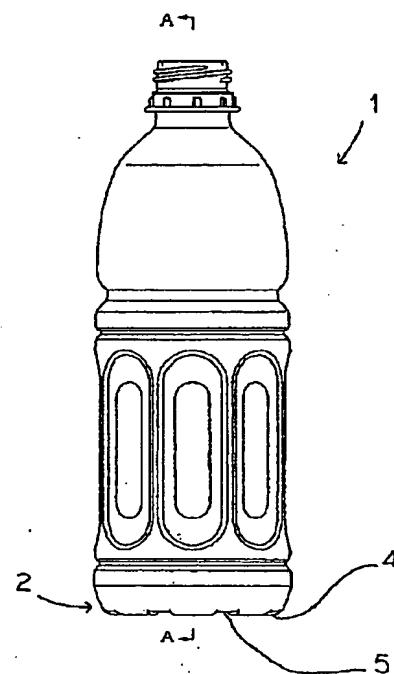
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(54)【発明の名称】 合成樹脂製ボトル

(57)【要約】

【目的】 製造が容易であり、加熱方法が正立状態で底部より加温されるプレートヒーターによる場合でも、底部の変形を防止することができ、自立安定性、形状保持性を損なうことのない合成樹脂製ボトルを提供する。

【構成】 底部がボトル内方に窪んだドーム部と該ドーム部の周囲に設けられる接地部とで構成されるボトルにおいて、上記接地部に切り欠きを設ける。



## 【特許請求の範囲】

【請求項1】 底部がボトル内方に窪んだドーム部と該ドーム部の周囲に設けられる接地部とで構成されるボトルにおいて、上記接地部に切り欠きを設けたことを特徴とする合成樹脂製ボトル。

【請求項2】 ドーム部に放射状に拡がる凹凸部が設けられたことを特徴とする請求項1記載の合成樹脂製ボトル。

【請求項3】 横断面形状を円形として、接地部の切り欠きとドーム部の凹凸部の凹部を、上記ドーム部の中心部からほぼ同一方向の放射線上に設けたことを特徴とする請求項1、2記載の合成樹脂製ボトル。

【請求項4】 横断面形状を四角形として、各隅角部の底部の接地部とドーム部の凹凸部の凸部を、上記ドーム部の中心部からほぼ同一方向の放射線上に設けたことを特徴とする請求項1、2記載の合成樹脂製ボトル。

【請求項5】 横断面形状を長辺と短辺からなる長方形として、ドーム部の周囲の接地部の長辺側に切り込みを設けたことを特徴とする請求項1記載の合成樹脂製ボトル。

## 【発明の詳細な説明】

## 【0001】

【産業上の利用分野】本発明は、果汁、ウーロン茶、コーヒー等の飲料を充填する、ポリエチレンテレフタレート樹脂等を二軸延伸プロセス成形した合成樹脂製のボトルの底部構造に関する。

## 【0002】

【従来技術】従来、底部がボトル内方に窪んだドーム部と上記ドーム部の周囲に設けられる接地部とで構成される合成樹脂製ボトルは、上記ドームの周囲全周が接地部として、構成されていた。

## 【0003】

【発明が解決しようとする課題】近年、特に冬場などの寒い時期には、合成樹脂製のボトルを店頭の加温器、保温器、あるいはホットベンダーに保管して、内容物の温度を適温に暖めた状態にしておくことが望まれている。ところが、上記ドーム部の未延伸厚肉部は熱に弱いため軟化して変形しやすく、また、加温によってボトル内が加圧状態になるため、底部全体が膨出して自立安定性、形状保持性が悪くなるという問題点があった。

【0004】上記の問題点を克服するために、上記ドーム部の未延伸厚肉部に凹凸部を設けることによって、ドーム部の強度の向上を図ったものもある。しかし、このようなボトルでも、上記ドーム部の変形は抑えることはできたが、接地部が熱の影響を受けて変形しやすく、特に加熱方法が正立状態で底部より加温されるプレートヒーターによる場合は変形が顕著であるという問題点があった。

【0005】そこで本発明は、製造が容易であり、加熱方法が底部より加温されるプレートヒーターによる場合

でも底部における接地部の変形を防止することができ、自立安定性、形状保持性を損なうことのない合成樹脂製ボトルを提供することを目的とする。

## 【0006】

【問題点を解決するための手段】上記目的を達成するために、本発明では、底部がボトル内方に窪んだドーム部と該ドーム部の周囲に設けられる接地部とで構成されるボトルにおいて、上記接地部に切り欠きを設けたことを特徴とする合成樹脂製ボトルが提供される。

10 【0007】また、本発明においては、上記ドーム部に放射状に拡がる凹凸部が設けられたことを特徴とする合成樹脂製ボトルが提供される。

【0008】更に、本発明においては、横断面形状を円形として、接地部の切り欠きとドーム部の凹凸部の凹部を、上記ドーム部の中心部からほぼ同一方向の放射線上に設けたことを特徴とする合成樹脂製ボトルが提供される。

20 【0009】また更に、本発明においては、横断面形状を四角形として、各隅角部の底部の接地部とドーム部の凹凸部の凸部とを、上記ドーム部の中心部からほぼ同一方向の放射線上に設けたことを特徴とする合成樹脂製ボトルが提供される。

【0010】その他、本発明においては、横断面形状を長辺と短辺からなる長方形として、ドーム部の周囲の接地部の長辺側に切り込みを設けたことを特徴とする合成樹脂製ボトルが提供される。

## 【0011】

【作用】上記のように構成されたボトルは、底部の接地部に形成された切り欠きが底部における接地部を少なくして、加熱器、保温器等の熱影響を軽減するとともに、接地部の強度を増大し、特に正立状態で底部より加温されるプレートヒーターを用いた加温器、保温器等で保管しても、底部の変形を防止することができる。

## 【0012】

【実施例】図面に基づき本実施例を説明する。図1、図2、図3は本発明の第一実施例で、横断面形状が円形の合成樹脂製ボトル本体1の底部2にはボトル内方に窪んだドーム部3が設けられている。底部2の上記ドーム部3の周囲は接地部4で、切り欠き5がドーム部3の周囲の接地部4にほぼ均等間隔に8個設けられる。ドーム部3には中心部から放射状に凹凸部6が形成されており、上記ドーム部3の強度を補強する役割を果たしている。凹凸部6の凹部7と凸部8は交互に放射状に並んでいる。底部2のドーム部3を除いた接地部は平面状となっており、接地部4に設けられた切り欠き5を除いた部分は接地面となる。

【0013】切り欠き5と凹凸部6の凹部7、接地部4と凹凸部6の凸部8は、各々中心部からほぼ同一方向の放射線上の同じ位置に設けられており、底部2の強度アップと共に成形性が向上する。

【0014】図4、図5、図6は本発明の第2実施例で、横断面形状が正方形の隅角部を面取りした角筒状の合成樹脂製のボトル本体1の底部2にボトル内方に窪んだドーム部3が設けられている。底部2には、ドーム部3の周囲の直線状の各接地部4にそれぞれ切り欠き5が設けられている。

【0015】底部2の隅角部9は接地部4となっており、ドーム部3に設けられた凹凸部6の凸部8と、中心部からほぼ同一方向の放射線上に設けられており、延伸倍率の大きい隅角部9の成形性を向上させる。

【0016】図7、図8は本発明の第3実施例で、長辺10、短辺11からなる横断面形状が長方形の隅角部を面取りした角筒状の合成樹脂製ボトル本体1の底部2に、ボトル内方に窪んだドーム部3が設けられており、ドーム部3の周囲の接地部4の短辺側、すなわち長辺部10に切り欠き5が設けられている。

【0017】特に横断面形状が長方形のボトルの場合は、胴部短辺側12と長辺側13、すなわち長辺部10と短辺側11の延伸倍率の差、強度のアンバランスにより加温時の自立安定性が損なわれる傾向にある。しかし、ドーム部3の周囲より短辺側12、すなわち長辺部10に切り欠き5を設けられることにより、長辺10の強度が補強されるため、加温時のボトルの自立安定性を保持することができる。

【0018】なお、必要に応じて長辺側13、すなわち短辺11にも切り欠き5を設けても良いし、ドーム部3に放射状に拡がる凹凸部を設けても良い。

【0019】本発明においては、底部の接地部に設ける切り欠きの形状、たとえば長さ、深さ、あるいは個数等は特に制限は無く、加温時、保温時、特に底部より加温されるプレートヒーターを用いた場合に、底部の変形を防止することができるものであれば良い。

【0020】また、本発明の上記実施例においては、底部の接地部を平面状として切り欠きを形成することによって、ボトルの自立安定性を向上させているが、上記接地部は下方に突出する小さな曲率半径から成る円弧状でも良く、あるいは直線から成るテーパー状でも良い。

【0021】更に本発明においては、底部の接地部に切り欠きを形成しているが、上記切り欠きはボトル本体の下胴部に延長して設けることも可能である。

【0022】

【発明の効果】本発明の合成樹脂製ボトルは底部の内方に窪んだドーム部の周囲に設けられる接地部に切り欠きを設けたことにより、接地部を少なくして、上記接地部の加熱時、保温時等の熱による変形を防止するとともに、接地部の強度を増大させる。

【0023】また、ライン搬送時の滑り抵抗を軽減することができるので、ボトル生産時や内容物充填時、実ボトル搬送時にスムーズに搬送を行うことができる。

【0024】上記ドーム部に放射状に拡がる凹凸部が設けられると、上記接地部の切り欠きと相まって底部全体の強度が向上する。

【0025】本発明において、横断面形状を円形とした合成樹脂製ボトルの場合、上記接地部の切り欠きと上記ドーム部の凹凸部の凹部を、上記ドーム部の中心部からほぼ同一方向の放射線上に設けると、底部全体の強度が増大するとともに、成形性、附形性が向上する。

【0026】本発明において、横断面形状を四角形とした合成樹脂製ボトルの場合、ドーム部の周囲の各辺に切り込みを設けると、底部の各辺の横剛性が増大する。

【0027】また、本発明において、各隅角部の底部の接地部とドーム部の凹凸部の凸部を中心部からほぼ同一方向の放射線上に設けると、成形性、附形性が向上する。

【0028】本発明において、横断面形状を長辺と短辺からなる長方形とした合成樹脂製ボトルの場合、ドーム部の周囲の短辺側、すなわち長辺側に切り込みを設けると延伸倍率の差が減少し、加温時の底部における接地部の変形が防止され、ボトルの自立安定性を保つことができる。

#### 【図面の簡単な説明】

【図1】本発明の合成樹脂製ボトルの第1実施例を示す正面図である。

【図2】図1の合成樹脂製ボトルのA-A断面図である。

【図3】図1の合成樹脂製ボトルの底面拡大図である。

【図4】本発明の合成樹脂製ボトルの第2実施例を示す正面図である。

【図5】図4の合成樹脂製ボトルのA-A断面図である。

【図6】図4の合成樹脂製ボトルの底面拡大図である。

【図7】本発明の合成樹脂製ボトルの第3実施例を示す判断面図である。

【図8】図7の合成樹脂製ボトルの底面拡大図である。

#### 【符号の説明】

1 ボトル本体

2 底部

3 ドーム部

4 接地部

5 切り欠き

6 凹凸部

7 凹部

8 凸部

9 隅角部

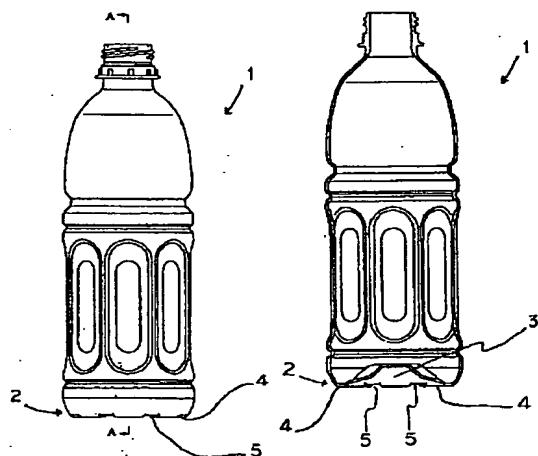
10 長辺

11 短辺

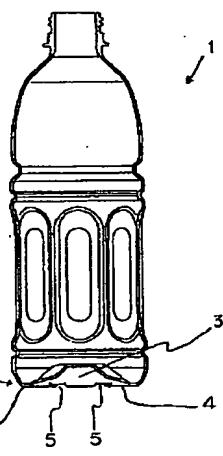
12 胴部短辺側

13 胴部長辺側

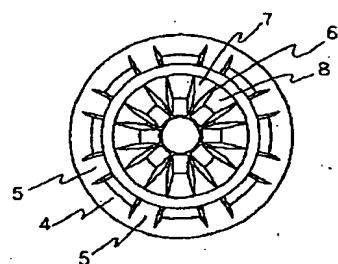
【図1】



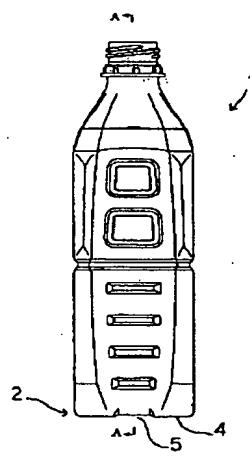
【図2】



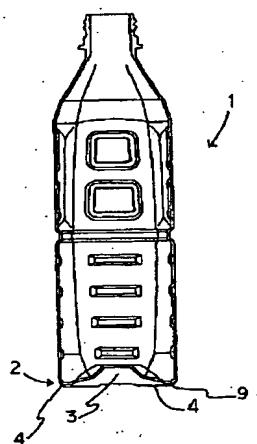
【図3】



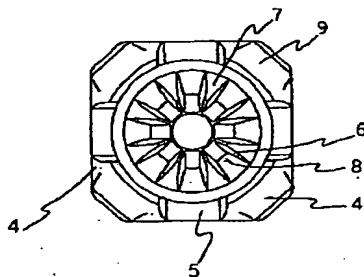
【図4】



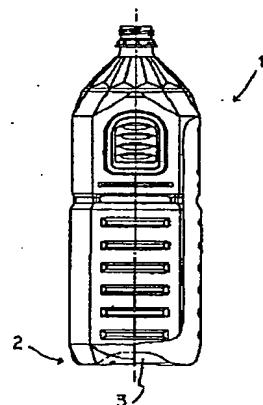
【図5】



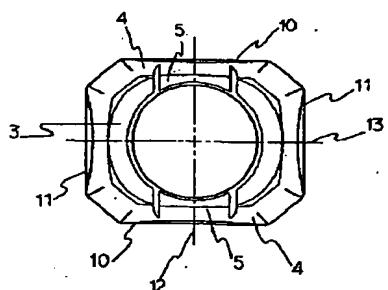
【図6】



【図7】



【図8】



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**CLAIMS**

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**[Claim(s)]**

[Claim 1] The bottle made of synthetic resin characterized by a pars basilaris ossis occipitalis preparing notching in the above-mentioned touch-down section in the bottle which consists of the dome section which became depressed in the method of the inside of a bottle, and the touch-down section prepared in the perimeter of this dome section.

[Claim 2] The bottle made of synthetic resin according to claim 1 characterized by preparing the concave heights which spread in a radial in the dome section.

[Claim 3] Claim 1, the bottle made of synthetic resin of two publications which make a cross-section configuration circular and are characterized by preparing mostly notching of the touch-down section, and the crevice of the concave heights of the dome section on the radiation of the same direction from the core of the above-mentioned dome section.

[Claim 4] Claim 1, the bottle made of synthetic resin of two publications which are characterized by preparing mostly the touch-down section of the pars basilaris ossis occipitalis of each corner, and the heights of the concave heights of the dome section on the radiation of the same direction from the core of the above-mentioned dome section by using a cross-section configuration as a square.

[Claim 5] The bottle made of synthetic resin according to claim 1 characterized by preparing slitting in the long side side of the touch-down section around the dome section as a rectangle which consists a cross-section configuration of a long side and a shorter side.

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## DETAILED DESCRIPTION

## [Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the pars-basilaris-ossis-occipitalis structure of the bottle made of synthetic resin which carried out biaxial stretching blow molding of the polyethylene terephthalate resin etc. filled up with drinks, such as fruit juice, oolong tea, and coffee.

[0002]

[Description of the Prior Art] Conventionally, as for the bottle made of synthetic resin which consists of the dome section to which the pars basilaris ossis occipitalis became depressed in the method of the inside of a bottle, and the touch-down section prepared in the perimeter of the above-mentioned dome section, the perimeter perimeter of the above-mentioned dome was constituted as the touch-down section.

[0003]

[Problem(s) to be Solved by the Invention] the bottle of the product [ stage / when a winter season etc. is recent years especially cold ] made of synthetic resin -- warming of a shop front -- to keep it to a vessel, an attemperator, or a hot vendor, and to change into the condition of having warmed the temperature of contents to optimal temperature is desired. However, since it softens with it since it is weak with heat, and it is easy to deform into it and the inside of a bottle will be in a pressurization condition by warming, the non-extended heavy-gage part of the above-mentioned dome section had the trouble that the whole pars basilaris ossis occipitalis bulged and independence stability and configuration holdout worsened.

[0004] In order to conquer the above-mentioned trouble, there are some which aimed at improvement in the reinforcement of the dome section by preparing concave heights in the non-extended heavy-gage part of the above-mentioned dome section. However, although such a bottle was also able to suppress deformation of the above-mentioned dome section, in response to the effect of heat, it was easy to transform the touch-down section, and when especially the heating approach was based on the plate heater warmed in the state of [ pars basilaris ossis occipitalis ] erection, it had the trouble that deformation was remarkable.

[0005] Then, this invention is easy to manufacture, even when the heating approach is based on the plate heater warmed from a pars basilaris ossis occipitalis, it can prevent deformation of the touch-down section in a pars basilaris ossis occipitalis, and it aims at offering the bottle made of synthetic resin which does not spoil independence stability and configuration holdout.

[0006]

[Means for Solving the Problem] In order to attain the above-mentioned purpose, in this invention, the bottle made of synthetic resin characterized by a pars basilaris ossis occipitalis preparing notching in the above-mentioned touch-down section in the bottle which consists of the dome section which became depressed in the method of the inside of a bottle, and the touch-down section prepared in the perimeter of this dome section is offered.

[0007] Moreover, in this invention, the bottle made of synthetic resin characterized by preparing the concave heights which spread in the above-mentioned dome section at a radial is offered.

[0008] Furthermore, in this invention, the bottle made of synthetic resin which makes a cross-section configuration circular and is characterized by preparing mostly notching of the touch-down section and the crevice of the concave heights of the dome section on the radiation of the same direction from the core of the above-mentioned dome section is offered.

[0009] Furthermore, in this invention, the bottle made of synthetic resin characterized by preparing mostly the touch-down section of the pars basilaris ossis occipitalis of each corner and the heights of the concave heights of the dome section on the radiation of the same direction from the core of the above-mentioned dome section by using a cross-

section configuration as a square is offered.

[0010] In addition, in this invention, the bottle made of synthetic resin characterized by preparing slitting in the long side side of the touch-down section around the dome section as a rectangle which consists a cross-section configuration of a long side and a shorter side is offered.

[0011]

[Function] warming using the plate heater which increases the reinforcement of the touch-down section and is warmed especially in the state of [ pars basilaris ossis occipitalis ] erection while notching formed in the touch-down section of a pars basilaris ossis occipitalis lessens the touch-down section in a pars basilaris ossis occipitalis and the bottle constituted as mentioned above mitigates thermal effects, such as a heater and an attemperator, -- even if it keeps it by the vessel, an attemperator, etc., deformation of a pars basilaris ossis occipitalis can be prevented.

[0012]

[Example] This example is explained based on a drawing. Drawing 1, drawing 2, and drawing 3 are the first example of this invention, and the dome section 3 which became depressed in the method of the inside of a bottle is formed in the pars basilaris ossis occipitalis 2 of the body 1 of the bottle made of synthetic resin with a circular cross-section configuration. The perimeter of the above-mentioned dome section 3 of a pars basilaris ossis occipitalis 2 is the touch-down section 4, and notching 5 is mostly formed in eight equal spacing at the touch-down section 4 around the dome section 3. The concave heights 6 are formed in the dome section 3 from the core at the radial, and the role which reinforces the reinforcement of the above-mentioned dome section 3 is played. The crevice 7 of the concave heights 6 and heights 8 are located in a line with the radial by turns. The touch-down section except the dome section 3 of a pars basilaris ossis occipitalis 2 serves as a plane, and the part except the notching 5 prepared in the touch-down section 4 serves as a ground plane.

[0013] The heights 8 of notching 5, the crevice 7 of the concave heights 6 and the touch-down section 4, and the concave heights 6 are respectively formed mostly in the same location on the radiation of the same direction from the core, and its moldability improves with the rise of a pars basilaris ossis occipitalis 2 on the strength.

[0014] Drawing 4, drawing 5, and drawing 6 are the 2nd example of this invention, and the dome section 3 which became depressed in the method of the inside of a bottle is formed in the pars basilaris ossis occipitalis 2 of the body 1 of a bottle made of rectangular pipe-like synthetic resin with which the cross-section configuration beveled the square corner. Notching 5 is formed in each touch-down section 4 of the shape of a straight line around the dome section 3 at the pars basilaris ossis occipitalis 2, respectively.

[0015] The corner 9 of a pars basilaris ossis occipitalis 2 is the touch-down section 4, is mostly prepared on the radiation of the same direction from the heights 8 of the concave heights 6 prepared in the dome section 3, and a core, and raises the moldability of the large corner 9 of a \*\*\*\* cage and draw magnification.

[0016] Drawing 7 and drawing 8 are the 3rd example of this invention, the dome section 3 which became depressed in the method of the inside of a bottle is formed in the pars basilaris ossis occipitalis 2 of the rectangular pipe-like body 1 of the bottle made of synthetic resin with which the cross-section configuration which consists of a long side 10 and a shorter side 11 beveled the rectangular corner, and notching 5 is formed in the minor-axis side 10 of the touch-down section 4 around the dome section 3, i.e., a long side.

[0017] the case where especially a cross-section configuration is a rectangular bottle -- the difference of the draw magnification of drum section minor-axis side 12 and major-axis side 13, long side side 10 and shorter side side 11, and strong imbalance -- warming -- it is in the inclination for the independence stability at the time to be spoiled. [ i.e., ] since [ however, ] the reinforcement of a long side 10 is reinforced by the ability forming notching 5 in minor-axis side 12 [10], i.e., a long side, from the perimeter of the dome section 3 -- warming -- the independence stability of the bottle at the time can be held.

[0018] In addition, notching 5 may be formed in major-axis side 13 [11], i.e., a shorter side, if needed, and the concave heights which spread in a radial may be prepared in the dome section 3.

[0019] the configuration of notching prepared in the touch-down section of a pars basilaris ossis occipitalis in this invention, for example, die length, the depth, or the number -- especially -- a limit -- there is nothing -- warming -- the time -- the time of incubation -- especially -- a pars basilaris ossis occipitalis -- warming -- having -- a plate heater -- having used -- a case -- the thing of a pars basilaris ossis occipitalis which can prevent deformation -- it is -- \*\*\*ing .

[0020] Moreover, in the above-mentioned example of this invention, although the independence stability of a bottle is raised by forming notching by making the touch-down section of a pars basilaris ossis occipitalis into a plane, the taper-like which consists of the small radius of curvature which projects caudad and which is good even when it is circular, or consists of a straight line is sufficient as the above-mentioned touch-down section.

[0021] Furthermore, in this invention, although notching is formed in the touch-down section of a pars basilaris ossis

occipitalis, the above-mentioned notching can also be extended and prepared in the bottom drum section of the body of a bottle.

[0022]

[Effect of the Invention] While the bottle made of synthetic resin of this invention lessens the touch-down section by having prepared notching in the touch-down section prepared in the perimeter of the dome section which became depressed in the way among partes basilaris ossis occipitalis and prevents deformation by the heat at the time of incubation etc. at the time of heating of the above-mentioned touch-down section, the reinforcement of the touch-down section is increased.

[0023] Moreover, since the slide wire at the time of Rhine conveyance is mitigable, it can convey smoothly at the time of real bottle conveyance at the time of bottle production and contents restoration.

[0024] If the concave heights which spread in a radial are prepared in the above-mentioned dome section, the reinforcement of the whole pars basilaris ossis occipitalis will improve conjointly with notching of the above-mentioned touch-down section.

[0025] In this invention, if notching of the above-mentioned touch-down section and the crevice of the concave heights of the above-mentioned dome section are mostly prepared on the radiation of the same direction from the core of the above-mentioned dome section in the case of the bottle made of synthetic resin which made the cross-section configuration circular, while the reinforcement of the whole pars basilaris ossis occipitalis will increase, a moldability and \*\*\*\*\* improve.

[0026] In this invention, if slitting is prepared each side around the dome section in the case of the bottle made of synthetic resin which used the cross-section configuration as the square, the horizontal rigidity of each side of a pars basilaris ossis occipitalis will increase.

[0027] Moreover, in this invention, if the touch-down section of the pars basilaris ossis occipitalis of each corner and the heights of the concave heights of the dome section are mostly prepared on the radiation of the same direction from a core, a moldability and \*\*\*\*\* will improve.

[0028] this invention -- if slitting is prepared in the minor-axis, i.e., long side, side around the dome section in the case of the bottle made of synthetic resin which was and made the cross-section configuration the rectangle which consists of a long side and a shorter side -- the difference of draw magnification -- decreasing -- warming -- deformation of the touch-down section in the pars basilaris ossis occipitalis at the time is prevented, and the independence stability of a bottle can be maintained.

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[Translation done.]

**\* NOTICES \***

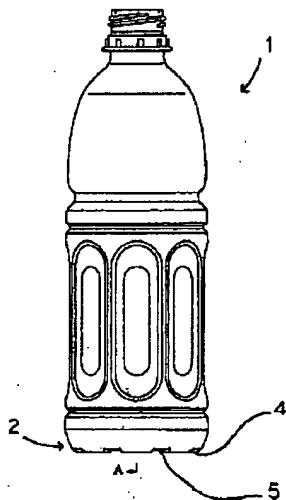
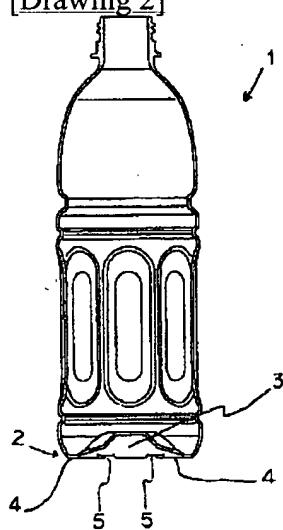
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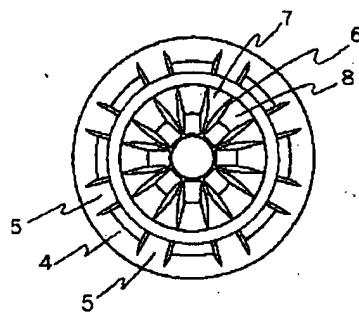
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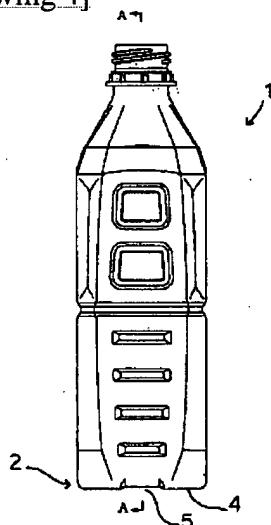
**DRAWINGS**

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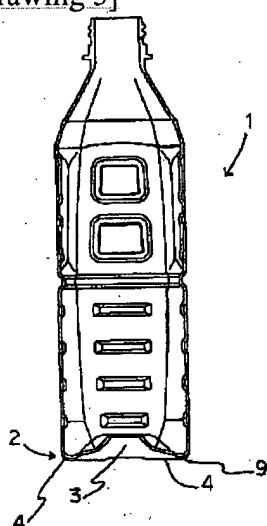
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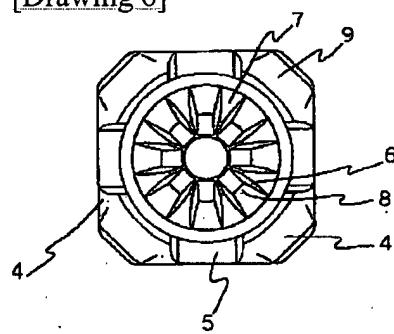
[Drawing 4]



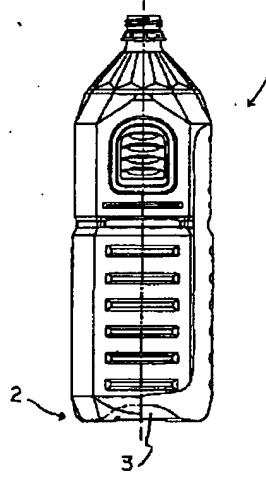
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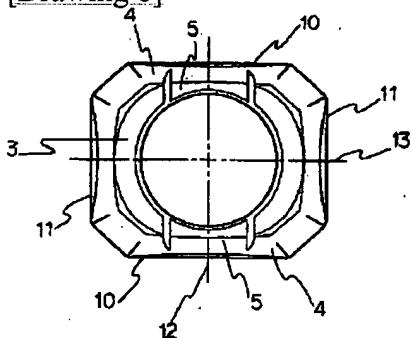
[Drawing 6]



[Drawing 7]



[Drawing 8]



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